

REMARKS

Claims 1-21 are pending in the application. Claims 1, 11, and 21 are amended herein. The Applicant hereby requests further examination and reconsideration of the application in view of these amendments and Remarks.

In the event that the Examiner believes that this response does not place the application in condition for allowance, the Applicant requests a telephonic interview between the Examiner and the Applicant's attorney Ian Hughes to discuss this amendment. The Applicant requests that the Examiner call Mr. Hughes (215-557-6659) to arrange a convenient time for such an interview.

In the office action, the Examiner rejected claims 1, 11, and 21 under 35 U.S.C 112, first paragraph, since the language implies that the receiver side receives digital samples in the frequency domain. Applicant has amended claims 1, 11, and 21 to clarify that the receiver side receives digital samples in the time domain.

In the office action, the Examiner rejected independent claims 1, 11, and 21 under 35 U.S.C 102(e) as being anticipated by U.S. Patent No. 6,657,950 to Jones, IV et al. (hereinafter "Jones"). In response, the Applicant submits that Jones does not anticipate the features of Applicant's pending claims.

Applicant's claim 1 recites:

"providing **transmission rate compensation**, . . . **the transmit path** compris[ing]: (1) a zero-padding module configured to **append one or more zeros to each set of received downstream coefficients**; and (2) an inverse transform module configured to **convert each set of zero-padded downstream coefficients into a corresponding block of downstream digital samples at the second data rate** [emphasis added]."

As recited in Applicant's claim 1, Applicant's invention provides for transmission rate compensation between first, second, and third rates. Transmission rate compensation includes appending zeros to frequency-domain coefficients. The zero-padded coefficients are then converted to a corresponding block of downstream digital samples with, for example, an inverse fast Fourier transform (IFFT) to generate time-domain digital samples. Thus, Applicant's invention, in the transmit path, applies zero-padding to frequency-domain coefficients before applying the transform

from the frequency domain to the time domain. See FIG. 3 and corresponding description in the Applicant's Specification at page 5, lines 14-24.

As described in the Background of the Invention at page 2, lines 7-29, transmission-rate compensation for discrete multi-tone (DMT) modems arises from the encoding IFFT and decoding FFT sizes (corresponding to the rates at which coefficients or samples are generated) being different. Prior-art DMT systems require a separate interpolator to provide transmission-rate compensation to generate digital samples at a third rate from decoded coefficients. The zero-padding in the transmit path, as recited in Applicant's claim 1, allows the decoding process in the receive path to generate the digital samples without a separate interpolation, thus allowing for transmission-rate compensation. See Applicant's Specification, at page 5, line 14, to page 6, line 3. Claims 11 and 21 recite similar features to those of claim 1.

Jones does not describe transmission-rate compensation. Jones describes a system for converting baseband orthogonal frequency division multiplexing (OFDM) signals (frequency-domain signals) into an intermediate frequency (IF) signal (time-domain signal) without substantially lengthening the channel impulse response of the OFDM signal. Jones transforms the OFDM signal into a time domain signal, that is upsampled before applying finite impulse response (FIR) filtering to the signal. Upsampling includes zero-padding of the time-domain signal to increase the sampling frequency, and the FIR filter is optimized for this new sampling frequency (see Jones, col. 4, line 39, to col. 5, 14). Jones does not describe a receiver path, does not describe rates in a receive path, and does not describe rate differences between transmit and receive paths. Thus, Jones does not describe or even suggest a problem related to transmission-rate compensation between the transmit and receive paths. Thus, Jones does not describe or suggest transmission rate compensation as recited in Applicant's claims.

Jones does not describe transmission-rate compensation where, in the transmit path, zero-padding is applied to frequency-domain coefficients before applying a transform from the frequency domain to the time domain. In fact, Jones describes, at FIG. 3 and accompanying description at col. 4, lines 39-54, first applying the inverse fast fourier transform (IFFT) to frequency-domain symbols (by IFFT 302 of Jones' FIG. 3) to convert to symbols in the time domain and then applying zero-padding (with upsampler 306 of Jones' FIG. 3). Such processing order of Jones is i) opposite to that of Applicant's claims and ii) similar to that of the prior-art method for DMT applications described in Applicant's Description of Related Art (Applicant's Specification, page 2, lines 7-15). For



Purposes of DMT applications, such processing order as taught by Jones requires use of an interpolator in the receive path, which is undesirable (Applicant's Specification, page 2, lines 23-29).

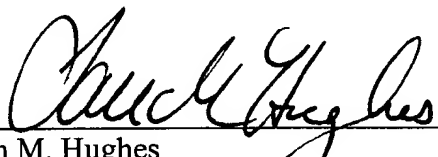
Therefore, Jones does not anticipate or obviate zero-padding of coefficients in the transmit path prior to applying a transform to convert frequency-domain coefficients to a block of digital samples in the time domain for transmission-rate compensation, as recited in Applicant's claims.

For all these reasons, the Applicant submits that claim 1 is allowable over Jones. For similar reasons, the Applicant submits that claims 11 and 21 are also allowable over Jones. Since claims 2-10 and 12-20 depend variously from claims 1 and 11, it is further submitted that those claims are also allowable over Jones. The Applicant submits therefore that the rejection of claims 1-21 under § 102(e) have been overcome.

In view of the above amendments and remarks, the Applicant believes that the pending claims are in condition for allowance. Therefore, the Applicant believes that the entire application is now in condition for allowance, and early and favorable action is respectfully solicited.

Respectfully submitted,

Date: 3/2/04
Customer No. 22186
Mendelsohn & Associates, P.C.
1515 Market Street, Suite 715
Philadelphia, Pennsylvania 19102



Ian M. Hughes
Registration No. 41,083
(215) 557-6659 (phone)
(215) 557-8477 (fax)